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Predicting Retention in Honors Programs

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INTRODUCTION

A number of challenges exist in providing the honors experience. Programs must compete for resources, coordinate departments, design dynamic curricula, and work toward changing goals. Among the many challenges, one of the hardest begins before students even enter the program. Honors admissions must select the students who will likely succeed in the program. After admissions, programs must then ensure that the program design encourages academic achievement and persistence in honors. To accomplish the goals and overcome the challenges of honors, a better understanding of the predictors of success is necessary. Using a logit regression model, my study will add evidence to previous research on the effectiveness of traditional admissions criteria such as high school grades and standardized test scores, contributing to a better understanding of honors students and their likelihood of success. The results of the study also reveal areas for future research, including the relevance of gender and ethnicity to graduation rates in honors.

PREVIOUS LITERATURE

In previous studies the significant predictors of student success in honors varied by study, college, program, sample, and definition of success. As a good example, Roufagalas (1994) revealed different predictors of success for honors students from different cohorts. For the 1991 honors cohort, high school grade point average (HSGPA), high school size, SAT Math, and the Test of Standard Written English were significant predictors of college grade point average (C-GPA) during the first two years of college. For the 1992 honors cohort, only the combination of HSGPA and the Test of Standard Written English remained a significant predictor of C-GPA, with the Test of Standard Written English declining in significance. Predicting enrollment in classes rather than C-GPA resulted in different significant variables. For both 1991 and 1992, only high school rank significantly predicted enrollment in

honors classes: students at the top of their high school took more classes in honors. Thus, within the same university different independent variables were found to be significant for different years, and the measurement of success changed the important predictors.

Roufagalas' study demonstrates two additional important dynamics of honors research regarding admissions, retention, and persistence in honors. First, significant predictors for honors programs may be different from those for standard college programs. In the Roufagalas study, SAT scores were useful for the non-honors-college population whereas HSGPA was the most important predictor of grades for honors students. Second, studies must include large sample sizes to reduce anomalies inherent to non-random sample selection. Even with sample sizes of 135 and 130, significant predictors varied by cohort. These results together reveal the importance of repeated research specific to honors in different years and schools.

A study conducted at Marquette University highlights differences between genders (McDonald & Gawkoski, 1979). HSGPA was a useful predictor of graduation with honors consistently for both males and females, but the statistical significance of SAT scores varied by gender and test section. SAT Math was significant and positively related to graduation with a .32 correlation for females and a .17 correlation for males. SAT Verbal was not significant for females but was significant and positively correlated at .14 for males. So among the four correlations, SAT Math was a much better predictor for females than any other set.

Measuring for a different type of success, Megert (2005) found that completion of an advanced high school math course was a significant predictor of honors scholarship retention and added to the predictive capacity of HSGPA scores. She concluded that honors retention could be improved by limiting scholarship recipients to students with previous advanced math course completion and high GPAs.

Researching within a single ethnicity, a study at a historically black college concluded that, in general, SAT verbal and first-semester college GPA (Coll-GPA) were useful in predicting honors students' persistence past two years of college (Allen, 2002). HSGPA and Coll-GPA were significant predictors of GPA at college graduation. On closer examination, though, the significant predictors varied greatly by demographic. The predictive validity of admissions criteria differed between genders and across majors. SAT scores were significant for some majors and non-significant for other majors. HSGPA was equally scattered, and some majors had no predictive variables. The results indicate that the predictive validity of traditional admissions criteria can vary by demographic even within a single ethnicity.

Campbell and Fuqua (2008) examined many of the same variables as my research. Campbell's research sample was also similar to the sample I used as it was conducted using a sample from a large public university. Discriminate and univariate analysis indicated that HSGPA, class rank, first-semester college GPA, honors-housing status, and gender were the most important predictors of honors program persistence and completion. Other variables were found to be relatively poor predictors of honors retention, including ACT, AP or College Level Examination Program (CLEP) credit hours, socioeconomic status, high school size, race, and initial credit-hour enrollment in honors.

The failure of standardized tests and the importance of high school grade point averages to predict honors success was also recently described by Marriner (2007), who evaluated the ability of several factors to predict college GPA for honors students, finding HSGPA to be strongly correlated and standardized test scores to be only weakly correlated.

Outside of honors, only a handful of studies have tested the predictive validity of SAT scores for specific program types. Most studies in college admissions center on predicting freshman grade point averages, but only a handful of studies use test scores and independent variables to predict completion of a specialized academic program. One study found that HSGPA and ACT Math scores were the best predictors of performance for freshman computer science classes (Butcher & Muth, 1985, p. 484). In contrast, a study conducted at Eastern Carolina University found a "weak relationship between SAT scores and college performance, confirming the suspicions and criticism of researchers and educators regarding the use of SAT scores in college admission. However, high school GPA is a relatively more reliable indicator of college level performance" (p. 481; Abdel-Salam, Kauffmann & Williamson, 2006).

Regarding retention rate differences for ethnicities and genders, research outside of honors has indicated that college success can differ greatly by demographic. Numerous studies have found differences between ethnicities, such as differences in graduation rates between Hispanics and Asians; studies have also indicated dynamics within ethnicities, such as differences between black males and females. On a national scale, women do better then men in persistence and graduation rates at collegiate institutions (Mortenson, 2008). However these differences vary by institution and demographic (Peltier, Laden, and Matranga, 1999). Some studies find gender significant; others do not (Campbell & Fuqua, 2008). Given the range of findings in both gender and ethnicity studies of retention, generalizations are not sufficient for specific institutional policy.

My research differs from previous honors literature in important ways. It is one of the largest sample sizes in honors research to date with over one

thousand records. With a large sample size spanning several cohorts of students, the problem of non-random sampling error, experienced in smaller samples such as Roufagalas (1993), was reduced. The size of the sample also allowed for a new method of analysis via a logit regression model. In adding to the limited selection of honors research, the logit regression methodology helps present a fuller understanding of honors students and programs.

METHODOLOGY

In order to evaluate retention and the effectiveness of current admissions criteria at the University of North Florida Honors Program, the following research uses logit regressions. This type of regression uses independent variables to predict the probability that an event will occur. The logit model employs completion of the honors program as the dependent event in regression. Several independent variables were used: high school grade point average (HSGPA), SAT scores, gender, program entrance year, and ethnicity. For more information on logit regressions refer to a text such as *Econometric Analysis* (Greene, 2002).

ACT scores were converted to SAT equivalents for 300 data points in this sample, using the concordance table published by the ACT (2008). This methodology was confirmed as accurate by research at UT Austin (Lavergne & Walker, 2008) due to a very strong correlation between the two tests. Similar regressions were also run without score conversions to measure for possible bias in score conversion; the results were similar and not significantly different from those presented here.

SURVEY DATA

At the UNF Honors Program, entering students take a seminar-style, six-credit-hour class. They then must take at least two three-credit classes that draw from a variety of disciplines, a one-credit service learning class, and then a one-credit portfolio class. In order to complete the honors capstone portfolio, students must maintain a 3.0 GPA and complete the necessary honors course load before registering.

The data for this regression include the entering class of 2002 through the entering class of 2005. During this five-year period, 1,017 students registered for honors and 35% completed the program. The average student had a 1252 SAT score and a 4.16 GPA at admission. High School Grade Point Averages (HSGPAs) were calculated at the time of entrance using a weighted four-point scale. Advanced Placement (AP), International Baccalaureate (IB), and American Institute for Creative Education (AICE) classes received one extra grade point, and honors classes received an extra half-point; no credits were awarded for classes in which students received below a "C."

STATISTICAL RESULTS

Table 1. Groups and Associated Data

Group	Sample Size	SAT		HSGPA		*Completion Rate*
		Mean	St Dev	Mean	St Dev	
Males	393	1267	91	4.08	0.33	24%
Females	622	1242	82	4.21	0.32	43%
Whites	858	1258	80	4.17	0.34	35%
Asians	53	1231	86	4.08	0.30	38%
Hispanics	53	1220	109	4.10	0.33	33%
Blacks	34	1193	123	4.11	0.28	32%
All	1012	1252	86	4.16	0.33	36%

Table 2. Logit Regression Variables

Variable	P-value	Lower Odds Ratio	Upper Odds Ratio
High School GPA (HSGPA)	0.000	2.07	5.01
SAT Score	0.098	1.00	1.00
Gender Female	0.000	1.58	2.88
Black	0.386	0.32	1.55
Hispanic	0.934	0.53	1.80
Asian/Pacific Islander	0.262	0.77	2.58
American Indian/ Alaskan Native	0.024	1.39	123.85
Other	0.375	0.25	38.60
Entering Class 2003	0.199	0.48	1.16
Entering Class 2004	0.852	0.68	1.61
Entering Class 2005	0.005	1.20	2.85
Entering Class 2006	0.246	0.83	2.04

Likelihood of completing portfolio (Y=1); number of observations = 1012;
log likelihood chi square = -613.067; p-value= 0.0000

SAT

SAT scores are not useful predictors of portfolio completion in honors at UNF. With an odds ratio of 1.0, SAT scores have little effect on the probability of completing honors. Furthermore, the variable is only significant at a 90% confidence level. These results parallel that of both Campbell and Fuqua (2008) and Marriner (2007), who concluded that SAT scores were poor predictors of success in honors. Other research within honors has sometimes noted significance for SAT score subsets, such as verbal scores for males, with a weak marginal effect (McDonald & Gawkoski, 1979). In general, my results confirm SAT as a poor predictor of honors completion.

HSGPA

HSGPA was the best predictor of program completion. Each quarter point increase in GPA yields an eighty percent increase in the probability of completing honors. These results are consistent with previous research, including McDonald & Gawaski (1979), Roufagalas (1993), Allen (2002), Marriner (2007), and Campbell and Fuqua (2008).

Gender

Gender was another strong predictor of portfolio completion. The results agree with honors research by Campbell and Fuqua (2008), who found that females completed honors at a significantly higher rate than males, with females completing at 47.95% and males at 29.58%. The logit regression model in this study suggests a very similar difference in gender completion rates: each female was between 58% and 188% more likely to complete honors than a male.

Ethnicity

Ethnicity is not a useful predictor. Blacks, Whites, and Hispanics do not differ from Asians (the excluded dummy variable in this regression) in their probability of completing the Honors program. Each ethnicity in this regression has a high p-value except for the "American Indian/American Native" category. It is difficult to draw conclusions from this category for two reasons: the sample is very small at five students, and the confidence interval is large, ranging from 39% to over 1000%. For the major ethnic groups listed in honors, ethnicity in this sample does not predict program graduation.

A number of regressions were run to test for interaction effects on portfolio completion between SAT and ethnicity, SAT and gender, HSGPA and ethnicity, and HSGPA and gender. The absence of interaction effects implies that SAT scores, GPA, and gender can be evaluated individually without

consideration for demographic distortions. As an example, the absence of interaction effects for GPA scores and gender implies that GPA scores are strong predictors of program completion for both males and females.

The results do not mean, however, that graduation rates by ethnicity are the same. The average academic profile of each ethnicity is slightly different within this honors sample. Therefore, the "average" student from each ethnicity has a slightly different probability of completing honors, but this difference is due to their gender and HSGPA rather than reasons outside of these two factors.

ENTRANCE YEAR

Among all of the cohorts, only the class of 2005 had a significantly different portfolio completion rate. The 55% increased probability of graduation compared to 2002, according to staff at the UNF honors program, stemmed from two program changes. The program decreased the credit-hour requirement and implemented more comprehensive advising policies in 2005.

Although these changes improved program completion in 2005, the benefits were not realized in 2006. The 2006 cohort graduated at a lower rate. According to staff, the drop in graduation after 2005 stemmed from staff turnover. Changes to the honors staff created a certain amount of instability that reduced the continuity and involvement of the staff with students (Heather Burk & Marcia Ladendorff, unpublished interview, July 2008). This assertion is speculative and cannot be proven through the survey data; however, the benefit of student-faculty contact is supported by previous research. The more contact students have with faculty, the more they persist in college (Endo & Harpel, 1982). Feldman confirmed this finding for honors students in a study of student dismissal and retention (1991). If the honors staff lacked the time to interact with students, or if previous relationships with faculty were dissolved with staff turnover, then the 2006 class may have been negatively affected by staff changes.

IMPLICATIONS

SAT SCORES

Given the widespread use of cutoff scores in honors programs (Brown, 2001; Pehlke, 2003), the poor ability of SAT scores to predict success has important implications for programs nationwide. The results of this study indicate that cutoff scores may reduce the diversity of a program and falsely exclude qualified demographics, as previous honors research and literature have argued (Grier, 1997). Even the College Board, owner and advocate of the test, warns against misuse of the SAT in this manner. The handbook of

guidelines for SAT implementation (College Entrance Examination Board, 2002) states that programs should "ensure that small differences in test scores are not the basis for rejecting an otherwise qualified student" and should "guard against using minimum test scores . . . unless properly validated" (9).

At UNF, if a minimum SAT score had been strictly enforced, a reduction in the percentage of minorities accepted to the program might have occurred (see Table 1 for mean SAT scores by ethnicity). If the program had used a higher admissions score requirement, it would have eliminated Hispanics and blacks from the program. This type of policy would have also likely excluded more diverse types of thinkers who do not do well on standardized tests but who would otherwise achieve great success in honors (Freyman, 2005). The results suggest that SAT scores are fundamentally useless for predicting success in honors and are likely to exclude otherwise qualified candidates. The results suggest that programs should therefore eliminate the use of SAT scores and rely on HSGP in order to increase program retention.

HSGPA

The results of my study at UNF indicate that honors administrators should make admissions decisions based on HSGPA. HSGPA scores, calculated using only a simple weighting method, were the best predictors of success.

While the strength of HSGPA scores in predicting success should not be assumed as precisely equal across programs, previous research confirms the importance of HSGPA in other programs. Past performance is clearly a predictor of future performance in honors, and academic success in high school should form the basis for admissions decisions in collegiate honors.

GENDER

The large differences in completion rate by gender require further research and evaluation. Previous honors research has indicated that there are clear differences between males and females among high-achieving students. One of the most distinctive differences is in the number of hours spent studying. In Noldon and Sedlacek's (1998) sample, females studied on average about 4–5 hours per week while males studied about 1–3 hours.

This difference in habits may in part explain why females finish honors at such a higher rate than males, but other systemic reasons for such large differences are likely. Previous research indicates that graduation rates differ by major in honors. In Campbell and Fuqua's (2008) study, engineering students were about half as likely to finish honors as other majors, and each major had a different graduation rate (p. 146). In my study, college major was not included. If the distribution of academic majors significantly differs by

gender, which it almost certainly does, then the difference in gender completion rates may be partially due to the students' academic majors.

Regardless of the reasons, there are huge differences in academic performance between genders. More females enter honors at UNF, and they complete honors at a higher rate than males. It seems unlikely that the selection of an academic major can solely account for such large differences in gender completion rates.

ETHNICITY

Previous research has indicated that the predictors of success vary by ethnicity and students from different backgrounds may require different strategies for retention. However, the design of the UNF Honors Program does not appear, at least from the results in this study, to support a dominant culture to the exclusion of other cultures or ethnicities. In fact, the culture of honors may encourage more balanced completion rates across ethnicities. Ottens, Johnson, and Green (1996) argued that the retention of regularly admitted students of color is better facilitated by the presentation of opportunities and challenges than by the removal of impediments. Honors may provide a good concept for this type of environment where students are encouraged and challenged.

CONCLUSION

The results of my study suggest that HSGPA is the most consistent predictor of success and that the use of SAT scores should be eliminated. To ensure diversity and wide-ranging success within honors, programs must also evaluate the effects of program policies and develop ways to encourage dynamic cohorts to continue at high rates. The results of this study also reveal huge differences between gender completion rates that must be evaluated and addressed.

At no point will every student be equally likely to complete an honors program, but graduation rates should be roughly equal across cultural and demographic backgrounds. The success of the UNF Honors Program in maintaining relatively equal graduation rates by ethnicity indicates that this kind of success is very possible, but programs must continually refine policies and instruments.

Finally, while the results of my study indicate a clear importance for HSGPA scores, other measures should be studied. Honors programs are intended to develop curiosity, diligence, a well-rounded set of interests, and an ability to participate in community. These qualities and abilities are complex, and students deserve sophisticated evaluation.

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